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Declarations under Rule 4.17:

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- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- of inventorship (Rule 4.17(iv)) for US only

Published:

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(54) Title: THREE DIMENSIONAL PERIODIC STRUCTURE AND METHOD OF PRODUCING THE SAME

(57) Abstract: There is provided a three dimensional periodic structure comprising two substances having different dielectric constants with a high contrast between the dielectric constants or refractive indexes, periodically distributed in a three dimensional space. A unit cell substrate having air holes in a diamond structure is formed by a stereo lithography method which repeats the step of irradiating light onto a liquid surface of alight-hardening resin such as a photosensitive epoxy resin in each layer in a cross-sectional pattern to be formed. Then, a conductive film made of, for example, Cu is formed by an electroless plating method on the surface of the unit cell substrate. Thus, a three dimensional periodic structure comprising two substances having different dielectric constants, i.e., resin and air, periodically distributed in a three dimensional space, and comprising a conductive film formed at an interface between the two substances is obtained.



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INTERNATIONAL SEARCH REPORT

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PCT/03/02031

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B6/12 C30B29/60 C30B35/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C30B 602B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search

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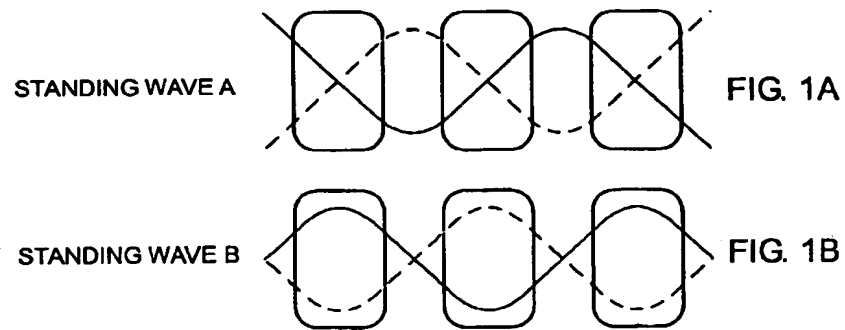


FIG. 2A

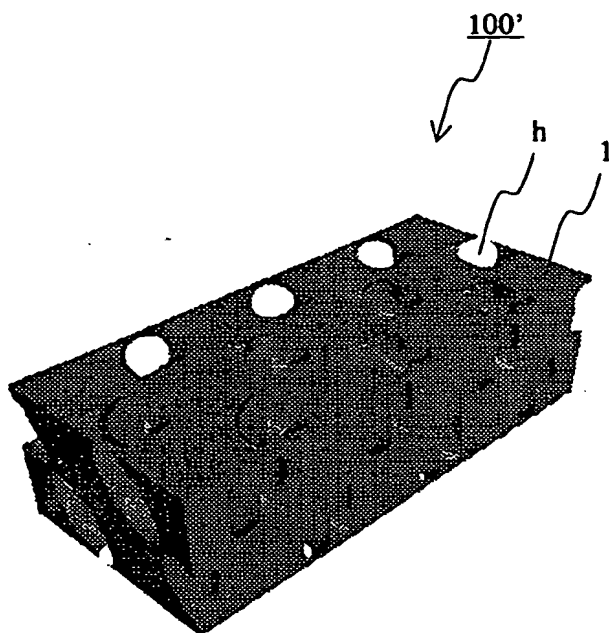


FIG. 2B

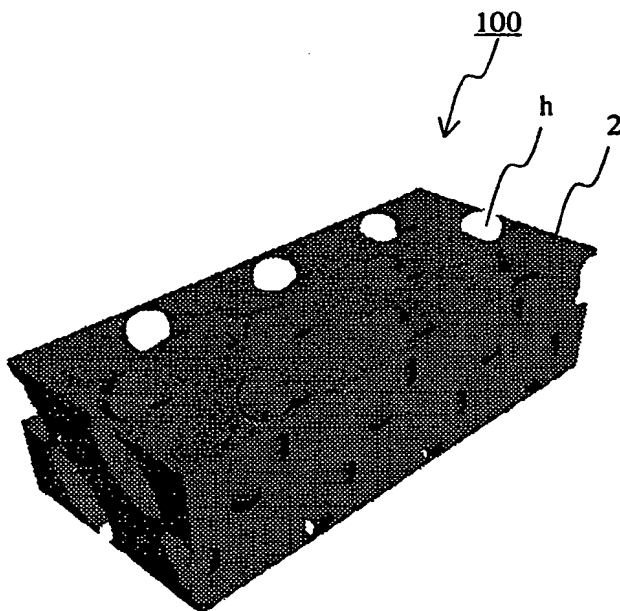




FIG. 3

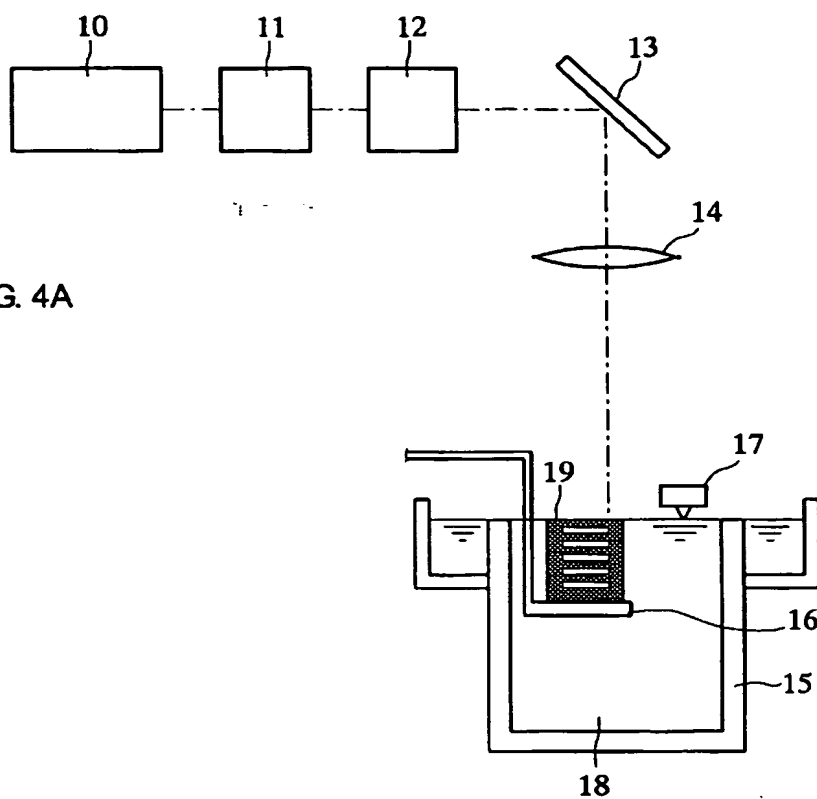
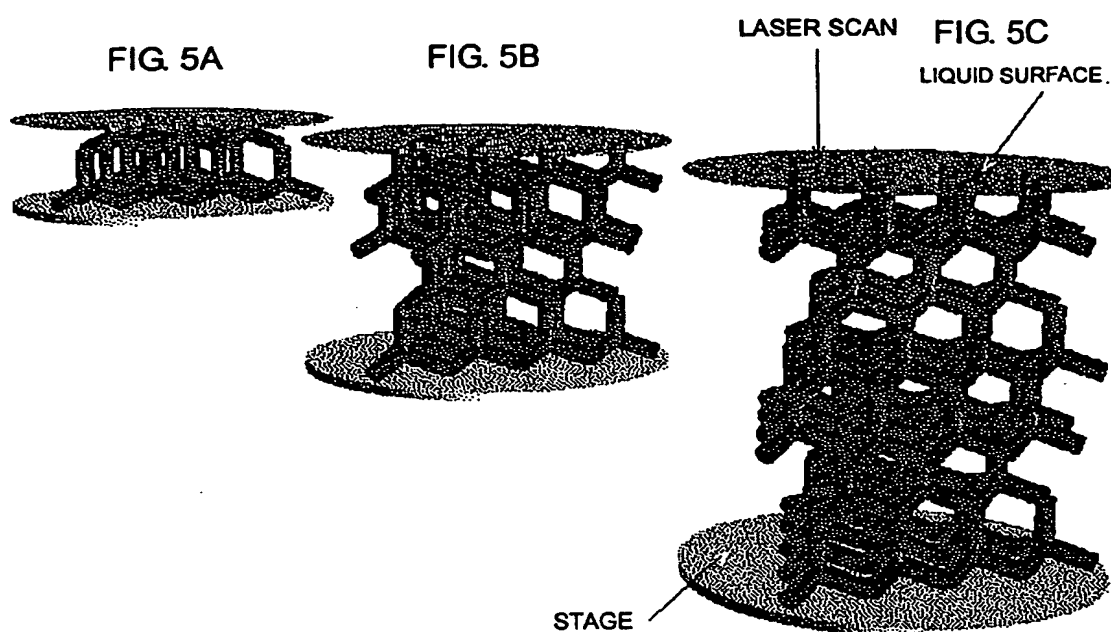


FIG. 4A

FIG. 4B



| [min] | Ω / \square |
|--------------|---------------------|
| PLATING TIME | SURFACE RESISTIVITY |
| 1 | 10000 |
| 2 | 0.91 |
| 3 | 0.63 |
| 5 | 0.56 |
| 10 | 0.33 |
| 20 | 0.10 |
| 60 | 0.01 |

FIG. 6

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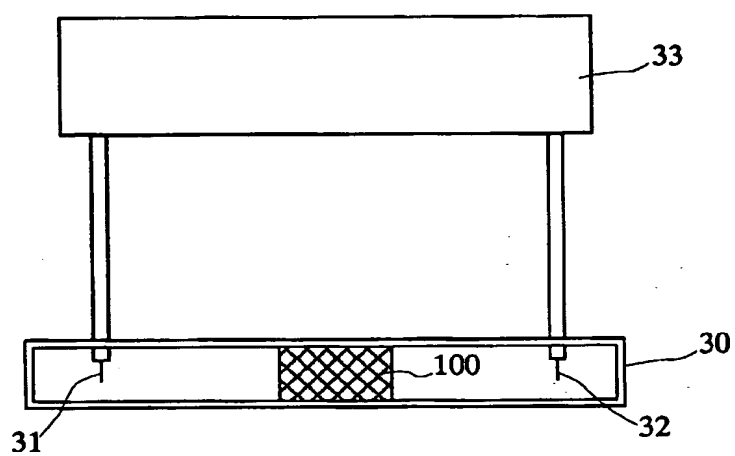


FIG. 7

FIG. 8A

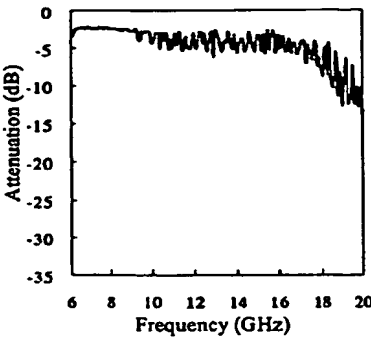


FIG. 8E

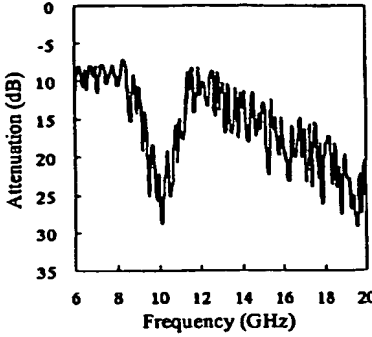


FIG. 8B

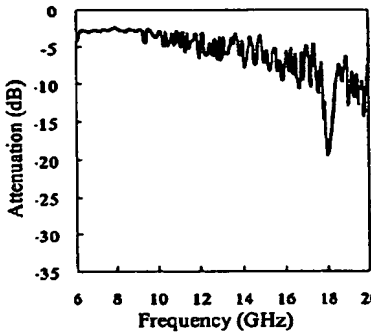


FIG. 8F

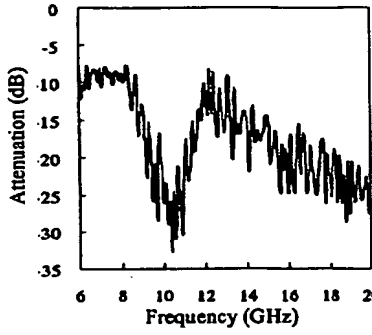


FIG. 8C

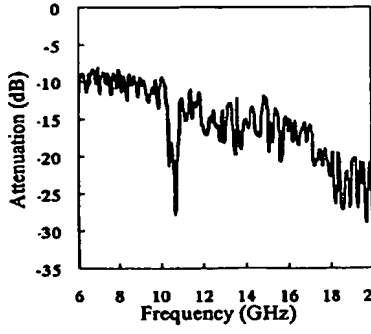


FIG. 8G

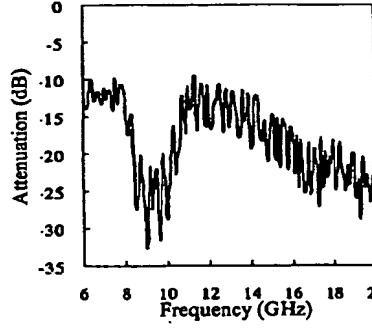


FIG. 8D

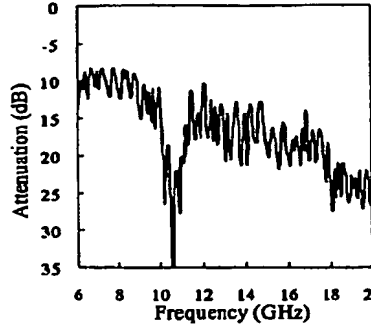
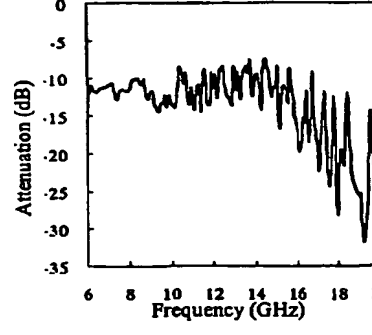


FIG. 8H



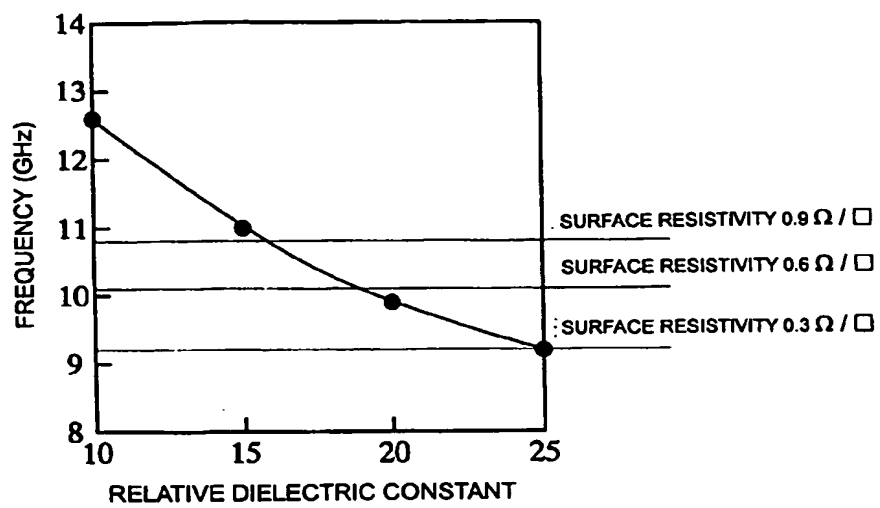


FIG. 9

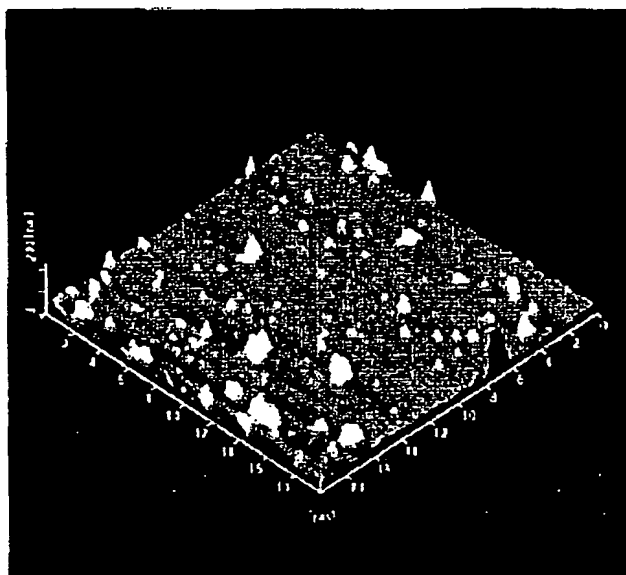


FIG. 10

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